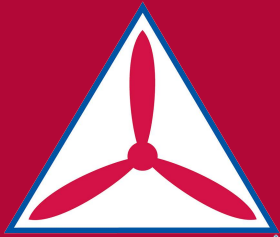


**Aerospace Education Excellence**

**AEX II**



**Activity Booklet**  
for  
**6-12th grades**

**PRODUCED BY**  
**CIVIL AIR PATROL**  
**AEROSPACE EDUCATION DIRECTORATE**

## Activity Eleven: Low Flying Hovercraft

### BUILD A REAL LOW-FLYING HOVERCRAFT

**OBJECTIVE** – To create, out of easily-obtainable materials, a working hovercraft that will “fly” across most smooth surfaces.



#### NATIONAL STANDARDS –

Next Generation Science Standards ([www.nextgenscience.org](http://www.nextgenscience.org)):

Disciplinary Core Idea Progressions

Physical Science Progression

- PS2.A: Force and motion

#### MATERIALS –

The rough estimate of the cost for this project is about \$200. The materials include:

- A 48” pre-cut round 1/2 inch plywood tabletop
- A gas-powered leaf blower. The builder can also use an electric leaf blower or even a canister-type vacuum cleaner with a blower fitting.
- A thick plastic sheet. The one used in this project was a 10 mm thick drop cloth.
- Electric saber saw
- A large roll of duct tape
- Three tubes of 1/2” pipe foam insulation (for the “bumper” on the edge of the plywood piece)

#### PROCEDURE –

There are two options: (1) buy a pre-cut plywood tabletop or (2) purchase a 4’ x 4’ square of 1/2 inch plywood and cut it with a saw. This project is based on purchasing a round tabletop just to avoid the possibility of a problem when cutting into a blank sheet. It is recommended that the plywood piece be round since pointed corners can cause injury.

Once the plywood piece is ready, a small hole must be cut near the edge of the tabletop to mount the “nozzle” or mouth of the leaf blower. The smaller hole should almost be a “press-fit” for the nozzle of the leaf blower to fit into. The best procedure is to trace around the nozzle end and then cut it. The smaller hole should be approximately 1/2 the distance from the center to the edge of the plywood tabletop. Next comes the skirt.

## Activity Eleven: Low Flying Hovercraft

A large sheet of 10 mm plastic is carefully cut and duct taped to the tabletop board. Once this is in place, a smaller coffee-can plastic lid is screwed to the underside. Next, a series of 2 inch holes are cut in the plastic skirt and this is where the air from the leaf blower moves outward near the surface of the floor. The leaf blower is mounted in the hole and sealed so that it doesn't leak. Attach the tubing to the outer edge as a "bumper." Once everything is ready, a common patio chair is placed on the hovercraft and the engine is started. If all works well, it should scoot across the floor with one or more adults "on board"!



A saber saw was used to cut a small mounting hole for the leaf blower. Notice the wearing of eye protection.

A 10 mm plastic sheet is laid under the tabletop at this point and a cut is made about 18 inches away from the plywood.

Next, a more accurate cut is made. In this case, one of the cadets is using a pen as a guide while the other cadet is making the cut.



The skirt is now duct taped to the tabletop piece. To make a really good seal, it is recommended that a second layer of tape be applied.

When finished, the skirt should look something like this.

The skirt on the flip side should be a reasonably tight fit.

## Activity Eleven: Low Flying Hovercraft



A smaller disk, preferably made from a polypropylene lid from a coffee can, will be mounted on the underside of the hovercraft.



The cadets make sure it is centered by using a measuring tape 90 degrees apart.



The smaller disk is now screwed into place. This lid forms a "donut hole" when the skirt is inflated. The rest of the skirt, out to the edge, will form the donut shape itself.



Tubing is attached to the edge as a "bumper."

## Activity Eleven: Low Flying Hovercraft



The leaf blower is now installed.



Duct tape is used to seal it in place so that little or no air will be able to leak around it.



### **IT FLIES!!**

A common patio chair is placed on the plywood board and a cadet gets to be the first test pilot.